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OPERATION SHAMROCK

The following report on Operation Shamrock, the March 17, 1953, atomic bomb test in Nevada, is presented for the information of all Pennsylvania civil defense officials and workers.

Part I - General Information

1. Operation Shamrock was primarily a scientific test made to gain technical information required for use in the Nation's weapons development program. Limited effects studies were made possible, however, by placing houses, "family type" bomb shelters and automobiles in the test area.

2. The bomb was exploded from the top of a steel tower 300 feet in height. To all practical intents and purposes, it was a "low-level" burst, which naturally would be expected to leave some lingering radioactivity in the vicinity of the explosion point.

3. Approximately 850 Army officers and men, together with Federal Civil Defense Administrator Peterson and 20 press, radio and television representatives, "witnessed" the explosion from five-feet-deep foxholes roughly two miles from the bomb tower.

4. Civil defense officials and other observers witnessed the explosion from News Nob, a point approximately nine miles from the bomb tower.

Part II - Test Structures

5. Two typical American houses, costing approximately $20,000.00 each, were exposed to the bomb. They were two-story, wooden-frame structures with cellar, attic and brick chimney, both alike in every detail. They contained no plumbing fixtures or gas and electric utilities, but did hold ordinary household furnishings, including venetian window blinds and rugs. House No. 1 was located 3,500 feet from the bomb tower, while House No. 2 was 4,000 feet farther away, or 7,500 feet from the tower.

6. Nine "family type" bomb shelters were included in the test. The nearest shelter, an underground, "basement-exit" type built of concrete blocks, was 1,250 feet from the bomb tower. The second, an underground, cinder block shelter with concrete slab roof covered with three feet of earth, was 1,450 feet from the tower. Three "covered trench" shelters with "shaft" entries were located roughly 1,800 feet from the tower. Each of the two test houses had two simple bomb shelters in its basement, one of the "slanting roof" type and the other of the "box", or "coalbin" type.

7. A total of 50 new and used automobiles of various makes and models, excepting convertibles, were placed in groups of three at different points up to a distance of two miles from the bomb tower.

8. To gain some idea of what might happen to people, store window mannequins, or "dummies", were placed in the houses, shelters and automobiles prior to the explosion. In the houses, the "people" were placed in various typical locations. There were family groups in the living and dining rooms, a woman in bed on the second floor and family groups in the basement shelters.

Part III - Bombing Effects

9. Explosion of the bomb characteristically was marked by a tremendous explosive flash, the rapid, writhing ascent of the fireball and subsequent formation of a typical mushroom-like cloud, which soon rose some 40,000 feet in the sky.

10. The "front-line" observers and troops in foxholes two miles from the bomb tower reported a powerful heat flash, flying rocks and sand and earthquake-like shaking of the ground. Civil defense officials and other observers on News Nob nine miles from the bomb immediately felt the explosive heat flash on their hands and faces, then some seconds later were jolted by the passing shock wave. This afterward could be heard rumbling and rolling up the surrounding canyons and mountainsides. The bomb's flash and blast were seen and heard at points from 300 to 400 miles away, including Los Angeles and Pasadena.

11. All within a period of three seconds immediately following the explosion, the No. 1 test house had been set afire by the flash, then the building was struck by the blast wave. The latter "blew out" the fire and violently pushed the building back off its cinder block cellar walls. The structure was left a twisted mass of wreckage, which rested on the badly crushed automobile previously parked just outside the back door.

12. Roughly 4 or 5 seconds after striking the nearer house, the blast wave hit the face of House No. 2. Its violent "push" blew in the front door and window sashes, tore through the rooms and "broke out" the rear windows. The roof was slightly "dished" and a few shingles were ripped off, but the chimney remained intact. Some of the floor joists were cracked and the plaster was seriously damaged by flying objects.

Preliminary surveys made by building engineers indicated, however, that while heavily damaged, the dwelling could be fully repaired for a cost of from $1,000.00 to $1,500.00, most of this being required for repair of interior finishings.

13. Post-explosion examination of House No. 1 indicated that all people on the first and second floors probably would have been killed, although some possibly might have escaped with serious injuries. On the first and second floors of House No. 2, the occupants hardly could have escaped some form of injury caused by falling and flying objects tossed about by the blast wave, but it is not very likely that many of them would have been killed.

14. Insofar as occupants of both houses are concerned, the important point is that all persons in the four basement shelters probably would have "come through" without serious injuries and possibly with none at all. The mannequins in the shelters appeared to be absolutely "untouched". In House No. 2, 7,500 feet from the explosion, even people in the cellar but outside the basement shelter, probably would have faced only the hazard of flying glass from the broken cellar windows.

15. Close to the bomb tower, the test automobiles were heavily damaged by the blast and the upholstery in some was set afire by the heat flash. At distances of 1 3/4 and 2 miles, the only damage to the vehicles was in the form of "dishing" of the tops of those with closed windows.

16. As the wind blew the "stem" of the bomb cloud over the two test houses, there was a "fall-out" of materials which left both the buildings and surrounding ground "contaminated" with radioactive "wastes". The everyday, exceedingly safe, industrial limits of exposure to radioactivity regularly adhered to in the Nation's atomic energy program

prevented observers from entering the area surrounding the two houses on the day of the bombing. Representatives of the test organization, however, went all through House No. 2 within several hours of the explosion. They suffered no injury as a result of the slight radiation exposures to which they were subjected. *Here, the fact in need of emphasis is that under actual wartime conditions, danger from radioactivity would not have prevented prompt entry by firefighters, rescue teams and other civil defense workers.* It is also important to understand that occupants of the basement shelters in both houses probably would *not* have been seriously injured either by prompt or by lingering radioactivity.

17. Although the five underground, "back-yard" type shelters were much closer to the exploding bomb than House No. 1, the structures were essentially undamaged and it is believed that they would have provided practically complete protection for their occupants.

Part IV - Conclusions Drawn

18. Operation Shamrock taught no really new lessons, neither do its results call for revision of the basic plans for State and local civil defense activities. Instead, the test most forcefully drove home the urgent need for strong re-emphasis of key survival facts already known. These all-important points are:

(a) Before and above everything else, each individual citizen immediately must learn the basic principles of self-protection, particularly the value of even simple "home type" shelters.

(b) Everyday community services -- police, firefighting, medical, etc. -- must be strengthened and coordinated in order to act with full efficiency in times of emergency.

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(c) Since no stricken city, or community, alone will be capable of meeting its own emergency requirements, each must be prepared not only to take care of itself insofar as possible, but also to help others in time of need.

(d) Even though their powers have definite limits, the mere existence of atomic weapons demands sound expansion and continued strengthening of the Nation's civil defense program throughout all levels of government, federal, state and local.

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